CHILDREN'S ACTION-CONTROL BEHAVIORS (COPING): A LONGITUDINAL VALIDATION OF THE BEHAVIORAL INVENTORY OF STRATEGIC CONTROL

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Integrating multi-axial models with an action-theory perspective, we propose that children's coping strategies vary along four dimensions of strategic behavioral control: Direct Action, Indirect Action, Prosocial Action, and Antisocial Action. The Behavioral Inventory of Strategic Control (BISC) assesses these four general dimensions of strategic control. We contrast these four axial dimensions with six specific strategic combinations: Avoidance (Indirect-Antisocial), Emotional Support Seeking (Indirect-Prosocial), Social Exploitation (Indirect-Antisocial), Social Cooperation (Direct-Prosocial), Aggressive Individualism (Direct-Antisocial) and Hostility (Indirect-Antisocial). In a short-term longitudinal study (three occasions over four months) of 318 children (grades 2–6), we examined the validity of the BISC, showing that the hypothesized dimensional structure of children's strategic control behavior was strongly supported.

Keywords: Action-control theory; Coping; Middle childhood

Although the adult literature on coping with stress has seen increased convergence in both theory and measurement, reviews have characterized the child-coping literature as somewhat lacking in theoretical integration (see Compas, 1987; Skinner & Wellborn, 1994). As a contribution toward greater integration, we present a multidimensional coping model that integrates multi-axial formulations (e.g., Hobfoll, Dunahoo, Ben-Porath & Monnier, 1994) with an action-theory perspective on human behavior.
(Brandstätter, 1998; Chapman, 1984; Eckensberger & Meacham, 1984; Frese & Sabini, 1985). To test our integration, we conducted a longitudinal validation of an instrument that assesses four axis dimensions of coping—the Behavioral Inventory of Strategic Control, or BISC (Lopez & Little, 1996; see also Little & Wanner, 1997). Specifically, using data from a short-term longitudinal study of a naturalistic context (Lopez & Little, 1996), we evaluate the inter-relations among children’s coping strategies assessed by the BISC and their concordance with the theoretical model from which they derive in order to empirically validate the instrument and its multiaxial conceptualization.

**AN ACTION THEORY MODEL OF STRATEGIC CONTROL**

As shown in Fig. 1, we propose that children’s strategic control can vary along at least four action dimensions: Direct Action, Indirect Action, Prosocial Action, and Antisocial Action. These dimensions delineate among the general directional focus of Action (Direct and Indirect) and the general Social orientation of Action (Prosocial and Antisocial). Within a given type of action (e.g., directionality), the two alternative dimensions of action (e.g., direct vs. indirect) are not bipolar expressions of an underlying continuum, but rather are exclusive categories of action (i.e., if a behavior reflects direct action, it cannot simultaneously reflect indirect action). However, because individuals can, and often do, utilize multiple strategies (typically successively) in pursuit of the same goal, their reports on the degree of strategy use can lead to some overlap (correlation) among the primary action dimensions. The behavioral characteristics measured by these dimensions are the degree to which action is either direct or indirect and either prosocial or antisocial, with inaction being the negation of any of these four dimensions.¹

¹ One can conceptualize the dimensional space of our model from two views. One view posits two bipolar dimensions—Prosocial vs. Antisocial and Direct vs. Indirect. The alternative view posits four orthogonal dimensions—Prosocial, Antisocial, Direct, and Indirect. This latter view is consistent with trends moving away from bipolar conceptualizations of such constructs as attitudes, stereotypes, and affect. In line with this general movement toward more complex representational models, we utilize a four-dimensional model. Moreover, the LISREL confirmatory factor models explicitly test which theoretical conceptualization best represents the data. In terms of the present study, the data clearly support a four-dimensional conceptualization.

![Diagram](https://example.com/diagram.png)

**FIGURE 1** The dimensions of action-control behaviors and their relations to common coping strategies utilized by children.

*Notes:* All dimensions except the centroid are measured by the Behavioral Inventory of Strategic Control (BISC).

As mentioned, similar models have been offered. For example, Hobfoll et al. (1994) developed a multi-axial model of coping that is also a strategy-based approach to coping. Coping strategies are defined as cognitive-behavioral strategies directed toward addressing a specific stressor or stressful situation. The Multi-axial Model of Coping organizes the possible strategies along an active-passive axis and a prosocial-antisocial axis. Although the BISC is similar in many respects to this and related multi-dimensional models, it extends these models in two ways. First, children’s coping strategies are seen as specific behavioral instantiations of the volitional control processes of action; that is, the planful behavioral strategies that serve to maintain or regain control in situations when it is threatened (Compas, Banez, Malarce & Worsham, 1991; Lopez & Little, 1996; Skinner & Wellborn, 1994). Second, the BISC explicitly measures the four axes
or action components (Indirect, Direct, Prosocial, Antisocial) as unique strategies. This unique feature allows a direct empirical test of the hypothesized multiaxial structure of coping strategies.

**Direct and Indirect Action**

Children's use of direct and indirect strategies has been well documented, particularly in response to failure experiences and uncontrollable events (Compas et al., 1991; Heckhausen & Schulz, 1995; Moos, 1997; Skinner & Wellborn, 1994). Direct action refers to control strategies aimed specifically at remediating a given stressor. Direct action strategies include, for example, problem solving, seeking information, and assertiveness (Band & Weisz, 1988; Elias et al., 1987). Indirect action refers to either remediating the consequences of a stressor or circumventing the need to address it. Indirect action strategies include, for example, avoidance, distraction, and emotion management (Althuuler & Ruble, 1989; Compas et al., 1991; Curry & Russ, 1985; Wertlieb, Weigel & Feldstein, 1987).

**Prosocial and Antisocial Action**

Control strategies can also vary in the degree to which they reflect prosocial versus antisocial action. Action-control theory posits that individuals can use both intra-agentic means (e.g., effort, ability) and extra-agentic means (e.g., parents, teachers) to achieve their goals. Prosocial action refers to behaviors that directly utilize extra-agentic means such as engaging or soliciting others' assistance. Antisocial action refers to (a) manipulating or coercing others, (b) viewing others as obstacles blocking effective stress management, and (c) preferring to cope without the assistance of others. With prosocial action, others are viewed as useful and positive means for goal pursuit. With antisocial action, others are viewed as negative means, not useful at all, or as hindrances to effective goal pursuit.

Prosocial coping behaviors have been linked to adaptive emotional adjustment (Pedro-Carroll, Alpert-Gillis & Cowen, 1992; Sandler & Barrera, 1984), while asocial and antisocial coping strategies have been associated with negative outcomes. For example, under duress, some children show increases in Type A behavior patterns (e.g., aggression, competitiveness, and impatience) which are linked to lower concern for the welfare of others (Matthews, 1982). In addition, strategies such as avoidance (Krohne & Rogner, 1982) and hostility (Matthews, 1982; Barnett, Matthews & Howard, 1979) have been identified as maladaptive.

**Aspects of Strategic Control**

In the BISC, we explicitly operationalize the four action tendencies of coping. These four dimensions reflect the independent, or "pure", influence of the primary action dimensions of strategic control: Direct Action, Indirect Action, Prosocial Action, Antisocial Action. These dimensions form four crossed quadrants (see Fig. 1) into which commonly measured strategies can be placed. Such coping strategies reflect bidimensional conjunctions between a sociability dimension (prosocial or antisocial action) and a directedness dimension (direct or indirect action).

Although numerous bidimensional (aggregate) dimensions are possible within such a framework (see also Skinner & Wellborn, 1994), we chose to assess six strategies based on their prominence in the literature: Avoidance (Indirect-Antisocial), Emotional Support Seeking (Indirect-Prosocial), Social Exploitation (Indirect-Antisocial), Social Cooperation (Direct-Prosocial), Aggressive Individualism (Direct-Antisocial), and Hostility (Indirect-Antisocial). We emphasize here that the strategies used in this study are only exemplars of the possible coping strategies that potentially fall within the quadrants defined by the primary action dimensions of strategic control. These strategies are not intended as exhaustive categorizations, but rather as prototypical exemplars to test underlying assumptions of multidimensional coping models (e.g., their dimensional structure).

Although the results presented below must be considered in light of the fact that other strategies may not adhere to this framework, exploratory analyses of extant coping measures have shown that the plethora of specific strategies measured across various instruments can be adequately summarized as four factors (see Cook & Heppner, 1997) and, depending on the rotation used, the strategies load on two of the four factors—just as dimensional models of coping would hypothesize. In the current study, we take a confirmatory stance and, unlike traditional factor analytic approaches,

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2 We selected the strategies based on: (a) theoretical prominence in the child coping literature; (b) strategies included in the Multiaxial Model of Coping; and (c) empirical work linking the strategies to the anxiety and social network outcomes used in the present study. As noted, they reflect only a limited number of the full range of coping strategies available to children.
we specifically operationalize the centroids of each factorial dimension (see Little, Lindenberger & Nesselroade, 1999). Such an approach allows us to measure the underlying dimensions directly and then project the various strategies into this four dimensional space to determine how adequately they capture the underlying information.

GENERAL EXPECTATIONS

We examined the structure of coping within a population of children whose general social networks were threatened — the children of the U.S. military in Europe. At the time of the study, the U.S. military was reducing its personnel in Europe (i.e., drawdown), including the complete closure of several military communities (see Lopez & Little, 1996 for details). As a result, these children were faced with a common and particularly stressful global threat, namely, the prospect of moving and the dissolution of their current social networks (Raviv, Kelnan, Abazan & Raviv, 1990; Starker, 1990). This study provides a novel opportunity to examine children’s strategic control because it reflects a naturalistic population wherein nearly all members were exposed to pervasive threats upon their social networks. We assessed the children three times in the final months before the closure of their school. At each occasion, the children knew that they would be moving but did not know when or where and each passing week brought compounded disruption as some teachers and families received early reassignment orders.

Our primary goal in this study is to provide empirical support of multidimensional models of strategic control. This study extends and contributes to prior research on children’s coping in three ways. First, drawing upon recent broad-based multiaxial conceptions of coping (Hobfoll et al., 1994; Sandler et al., 1994; Skinner & Wellborn, 1994), we provide an empirical test of two important assumptions underlying such approaches to coping: namely, that coping behaviors can be represented as a set of fundamental dimensions and that these primary dimensions are related to relevant outcomes such as anxiety or loneliness. Second, our longitudinal design (three occasions at approximate 5-week intervals) allows us to (a) replicate the structural relations across time, and (b) explore the short-term stability and malleability of the strategic control behaviors. Third, the participants’ circumstances wherein threats to their social networks were wide-spread and ongoing provides a rare opportunity to study these relations within a naturally turbulent context.

HYPOTHESIS 1 Consistency in the structural relations between strategies and axes. We expected the correlations for the six aggregate control strategies to correspond with their constituent primary action dimensions of strategic control. In other words, a given aggregate control strategy should be moderately and positively correlated with the underlying primary action strategies of which it is comprised. For example, Social Cooperation should be positively related to both Prosocial Action and Direct Action.

HYPOTHESIS 2 Cross-time structural invariance. We expected the structure of the strategic control behaviors to remain invariant at each measurement occasion. That is, the fundamental structure among the constructs should hold across time, independent of the contextual changes. Here, changes in the specific behaviors used by a given individual should emerge as fluctuations in the individual-differences stabilities of the constructs and perhaps as mean-level changes, but not fundamental structural changes. We expected the stabilities to be fairly low because of the ongoing turbulence of the situated context. In other words, although we fully expected mean-level and cross-time differences, we did not expect differences in the relationships between the strategies and their corresponding dimensions of action.

HYPOTHESIS 3 Mediated predictive validity. We expected the four primary action-control dimensions to mediate the predictive relations of the six aggregate action-control strategies. To test this hypothesis, we used four outcome measures (loneliness, social avoidance, state anxiety, and number of friends) that were available from the second measurement occasion.

METHOD

Participants

For these analyses, we included 318 children who participated in at least two of the three times of measurement (grade 2: n = 67, 60% girls, 7.8 years; grade 3: n = 72, 56% girls, 8.9 years; grade 4: n = 65, 60% girls,
9.7 years; grade 5: n=56, 54% girls, 10.7 years; grade 6: n=58, 51% girls, 11.8 years). The participants came from the elementary school for dependents of the U.S. military in Berlin, Germany. They were predominantly middle class, coming primarily from enlisted families (80%) and included 45% White, 35% African-American, and 13% Hispanic children. Because we found no evidence of ethnic differences on the constructs in this study, we collapsed across ethnic status (see also López & Little, 1996).

Testing Procedures

We tested the children in three sessions (mid December, 1993, late January, 1994, and early March, 1994) in groups ranging from 20 to 55. Each item was read aloud by a proctor while the children followed silently along and additional proctors assisted. Each testing session saw compounded disruption as some teachers were transferred and the classrooms were restructured.

The BISC

As mentioned, the BISC explicitly assesses the four primary axis dimensions and includes six aggregate or bidimensional strategies (see Table I for sample items). The primary dimensional strategies, Direct Action, Indirect Action, Prosocial Action, and Antisocial Action, were each assessed by a set of three items. The six aggregate strategies, Avoidance, Seeking Emotional Support, Social Exploitation, Seeking Social Cooperation, Aggressive Individualism, and Hostility, were each assessed with a set of six items, except Hostility, which was assessed by three items. Children indicated how often they engaged in each coping behavior (1 = hardly ever, 2 = sometimes, 3 = often, 4 = almost always). The situation specific nature of the context was established by using the frame, “When I have a problem like moving to a new duty station and having to make new friends.” Reliabilities were sound (see Appendix Table A1).

Outcome Measures

Using data from the second measurement occasion, we examined four outcome constructs to test the mediational and predictive validity of the BISC constructs: state anxiety, loneliness, social avoidance, and number of friends. For anxiety we used the State-Trait Anxiety Inventory for Children (STAIC; Spielberger, 1972). Both the state-inventory and trait-inventory items showed sound levels of reliability ($r_{xx} = .88$ and .89, respectively). For loneliness, we used a scale adapted from Asher, Hymel & Renshaw (1984; $r_{xx} = .72$), for social avoidance, we used a scale from Hymel, Franke
& Freigang (1985; $r_{cc} = .81$), and for the number of friends, the children named their friends across various contexts ($r_{cp} = .72$).

**Analytic Procedures**

We used longitudinal mean and covariance structures (MACS) analyses (Jöreskog & Sörbom, 1989; Little, 1997) to test our hypotheses. In addition to numerous psychometric advantages, such as estimating and correcting for measurement error and explicitly evaluating the measurement validity of each construct, MACS models are ideally suited to test our hypotheses because of the ability to test theoretically imposed constraints (Jöreskog & Sörbom, 1989). We assessed model fit using standard measures of practical fit: the non-normed fit index (NNFI), the incremental fit index (IFI), and the root mean squared error of approximation (RMSEA), and we tested our specific hypotheses as nested-model comparisons (i.e., as $\chi^2$ difference tests).

**Model Structure**

We represented each BISC construct at each wave with three aggregated parcel indicators (Kishton & Widaman, 1994; Lopez & Little, 1996). We also included and thereby controlled for (a) the effects of gender, (b) the linear effects of grade in school, and (c) because of possible non-linear developmental changes, the quadratic effects of grade in school. In specifying the longitudinal model, we constrained the measurement parameters (i.e., the item-to-construct equations) of each corresponding indicator for a given construct to be equal at each time point (i.e., cross-time measurement invariance) but placed no constraints at the construct, or latent level, and we allowed corresponding items’ unique factors (residual variances) to correlate across time. This base-line model fit the data very well (NNFI = .89, IFI = .91, RMSEA = .046) and indicates that the measurement properties underlying the instrument are equivalent across time (i.e., each construct can be operationally and empirically defined in precisely the same manner at each time point). The reliability and validity information from this model is given in Appendix Table A1. Importantly, the strong measurement validity of the BISC at each time point allows us to pursue rigorous tests of our hypotheses on the emergent latent constructs.

**RESULTS**

We present our results in three sections. First, we describe the nature of the covariate effects and the longitudinal relations (i.e., mean-level changes and stability coefficients). Second, we examine the structural composition of the action-control behaviors at each point in time. Finally, we examine the relative predictive validity of the various action-control behaviors.

**Covariate and Longitudinal Effects**

**Covariate Effects**

The covariate effects are summarized in Table II. The tabled values are the large sample z-scores of the difference from zero. Because of the overall number of tests and the probability of chance-related differences, we focus only on the pronounced (i.e., $p < .01$) differences. Using this criterion, one gender difference emerged for Social Exploitation at Time 3, with boys reporting more exploitive behaviors than girls. Regarding the grade-related effects within each time of measurement, a number of consistent patterns emerged. Specifically, Direct Action, Avoidance, Social Cooperation, and Emotional Support showed pronounced decreases (sometimes with a quadratic slowing; see e.g., Avoidance) on at least two of the measurement occasions. The inconsistency in the other grade-related effects suggests that situational factors might have influenced the children’s self-reports.

**Mean-level Differences**

As seen in Table II, several cross-time mean-level differences emerged. First, the children reported less use of Avoidance, Social Cooperation, Emotional Support, and Aggressive Individualism at Time 3. No differences emerged for Social Exploitation or Hostility. Finally, and consistent with the aggregate strategy differences, the children reported less use of Direct Action, Indirect Action, and Prosocial Action at Time 3.

**Stability Information**

As expected, the action-control behaviors showed only weak to moderate stability across the approximate 3-week intervals. The cross-time latent correlations ranged from a low of .36 (Social Exploitation between Times 1
and 2) to a high of .58 (Antisocial Action between Times 2 and 3) with a median of .45.

The Structure of Children’s Action-Control Behaviors

Figure 2 presents the constrained latent correlational structure among the action-control behaviors measured in the BISC. These constrained correlations, testing the concurrent validity of the correlational structure, fits the manifest data as well as the unconstrained correlations (i.e., all constraints are within the tolerance statistics, or standard errors, of the unconstrained correlations), $\chi^2_{(175, n=318)} = 134.4, p = .10$. Although we tested and found support for the hypothesized structure using various techniques, we present the simplest and most transparent format which is the basic correlational structure among the constructs.

In examining the intercorrelations among these constructs, a number of features must be kept in mind. First, these are latent correlations among the reliable variances of the constructs (i.e., random measurement error is removed). Second, with very few minor exceptions (i.e., differing only in magnitude; see Fig. 2), the correlational structure was equivalent at each point in time. This structural equivalence is particularly noteworthy given
the weak-to-moderate levels of the individual-differences stability in each corresponding type of coping behavior. Although individual children changed and utilized different strategies to varying degrees, the correlational structure remained stable and identical across time. Structural invariance lends further support to our theoretical model because the interrelations among the dimensions are robust to changes across time and the social context of the children.

Finally, the correlations between the primary action dimensions and their corresponding aggregate strategies were in the expected direction and were of higher magnitude than the correlations with the other theoretically orthogonal primary action dimension. For example, the aggregate strategy, Emotional Support Seeking, correlated .64 with each of its constituent primary action dimensions, Indirect Action and Prosocial Action (see Fig. 1); it was essentially uncorrelated with Antisocial Action ($r = -.04$) and only weakly correlated with Direct Action ($r = .21$). Only Individualism was an exception at Time 1 and Time 2 because it correlated equally with Indirect and Direct Action ($r = .21$; see Fig. 2).

### The Mediational and Predictive Validity of the BISC

To examine the mediational and predictive validity of the BISC, we specified two structural models. For both models, we also included, gender, grade in school (both linear and quadratic), and trait anxiety as covariates. In the first model, the primary action dimensions were hypothesized to mediate the predictive effects, or outcome relations, of the bidimensional aggregate strategies. In the second model, the aggregate strategies were specified as mediators of the primary action dimensions. This second model was not supported because both Direct Action and Antisocial Action had unique effects on the four outcomes (Baron & Kenny, 1986). In Fig. 3, we present the results of the final model wherein the primary action dimensions mediate the predictive effects of the aggregate behaviors. The fit of this model was quite good, $\chi^2(946, n = 318) = 1533.4$, RMSEA = .044, NFI = .90, IFI = .91. The estimates, which are significant, $p < .01$, are from the LISREL standardized solution. The covariate effects are not presented but were nearly identical with those detailed in Table II.

As shown in Fig. 3, the pattern of predictive relations was uniformly consistent with our theoretical hypotheses. The primary action dimensions mediated the effects of the aggregate strategies on the four outcome constructs (either directly or indirectly). These patterns of predictive relations provide further support for multidimensional conceptualizations of coping. Notably, Direct Action strategies showed the broadest predictive

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**Figure 3** The predictive relations among the behavioral coping strategies and the outcomes. *Note:* Only the data from Time 2 were used for this model. This model shows that the primary action dimensions are sufficient to mediate the predictive relations of the aggregate strategies; however, a model testing the opposite mediational pattern (i.e., wherein the aggregate strategies mediate the primary action dimensions) was not supported. Gender, age effects (linear and quadratic), and trait anxiety were controlled. Model fit was quite good, $\chi^2(946, n = 318) = 1533.4$, RMSEA = .044 ($p < .001$), NFI = .90, IFI = .91. The estimates, which are significant, $p < .01$, are from the LISREL standardized solution.
validity, with moderate to strong positive effects on each outcome. In addition, Antisocial Action showed negative, or maladaptive, effects for each outcome construct except the number of friends. Importantly, although the covariates uniquely accounted for sizable proportions of the total explained variance in the four outcomes (ranging from 8 to 26% and mostly related to grade effects), the action-control strategies uniquely accounted for 13 to 14% of the reliable variances.

The effects shown in Fig. 3 do not mean that Prosocial and Indirect forms of coping do not have an influence. Instead, both dimensions also had quite strong positive relations with the outcomes. The lack of direct paths to the outcomes is because the direct action and antisocial action dimensions had stronger influences; that is, they captured both the common variance among the four dimensions and had the larger unique effect. Also note that the aggregate strategies also have an effect on the outcomes, but only indirectly mediated through the dimensional constructs. Finally, as mentioned, the converse was not the case. The specific strategies did not fully mediate the effects of the global dimensional constructs. Taken as a whole, all the results presented here converge on supporting the conclusion that coping behaviors can be adequately represented as global dimensions of coping and that the four dimensions we examined are veridical and powerful predictors of well-being and adjustment.

DISCUSSION

The present study examined a large group of children in an extraordinary social circumstance; namely, a large sample that is experiencing the same stressful situation at the same time. Given the unique nature of this population, we feel that our study significantly contributes to the literature on how children cope with both acute and chronic stressors.

Although this study represents only a first test of some critical assumptions underlying multidimensional models of coping, the results are very encouraging. The correlational structure among the primary dimensions and the aggregate strategies generally conformed to the expected pattern (with the slight exception of Individualism). In addition, the longitudinal nature of our study allowed for an elaborated validation of the multidimensionality of children’s coping (see Compas, 1998). In particular, the fundamental structure and inter-relations among the coping dimensions and strategies were nearly identical at each of the three measurement occasions. This finding implies that the relative psychological relations among the constructs is quite stable over time, even though the children were experiencing on-going challenges and difficulties (Lopez & Little, 1996). Finally, the pattern of predictive relations also corresponded well with our hypotheses. Here, the four primary dimensions mediated the predicted effects on the well-being and adjustment outcomes, with Direct Action and Antisocial Action carrying the predictive weight, and they explained sound proportions of variance above and beyond the covariate effects. In other words, these primary dimensions appear to be sufficient to predict individual differences in the well-being and adjustment outcomes represented in this study. All told, then, the findings from our study provide broad support for multidimensional conceptualizations of coping.

We emphasize here that the model we tested is not necessarily novel and we have not radically redefined children’s coping; however, it does provide a new basis for integrating many extant views of children’s coping that previously had not been coherently integrated (Compas, 1987). Moreover, this model does not invalidate existing conceptions of children’s coping behaviors (Band & Weiss, 1988; 1990; Hohfoll et al., 1994; Sandler et al., 1994; Skinner & Wellborn, 1994). Instead, it provides an empirically validated umbrella under which many extant strategies identified in children’s coping can be organized.

On the other hand, an important advantage of action theory lies in its facility to demarcate, a priori, the fundamental dimensions of intentional action such that the underlying nature of action-control behaviors can be deductively identified (Little, Hawley, Henrich & Marsland, in press). Our action-theory perspective allows us to conceptualize children’s coping as strategic behavioral control. From this vantage point, as mentioned, coping strategies reflect behavioral instantiations of intentional action that aim to maintain or regain control in specific situations when one’s control is threatened (Compas et al., 1991; Lopez & Little, 1996; Skinner & Wellborn, 1994).

In our framework, we differentiated between the direction of action (direct vs. indirect) and the degree to which others are engaged (prosocial) or avoided (antisocial). Although these dimensions are not exhaustive categorizations of children’s action-related behaviors, they do encompass a broad range of behavior. By explicitly measuring the “pure” components of our multidimensional model (i.e., direct, indirect, prosocial, and antisocial
behaviors), we were able to test whether the specific aggregate strategies are, in fact, comprised of the action tendencies measured by the primary action dimensions. Again, our findings support this conceptualization. In our view, the implications of such a conceptualization are fairly far reaching and indicate important directions for future research.

A first implication of this perspective is that the plethora of specific strategies, which have been well documented in the literature, may be somewhat redundant in that they reflect only slightly different constellations of the primary action dimensions (e.g., more or less antisocial and more or less indirect). An important direction for future research would be to test the multidimensional structure of even more specific strategies that currently exist in the literature and to verify whether these strategies too would conform to the proposed dimensional structure.

A second implication is the possibility to simplify measures of coping. To the degree that the primary action dimensions are able to capture the breadth of possible coping strategies, one could measure only the primary dimensions in order to profile children’s coping behaviors. Here, future work would need to focus on determining cut-offs and absolute values that would indicate adaptive or maladaptive coping patterns as reflected in the possible profiles that the four primary action dimensions would yield.

A third implication is that although our findings suggest that the primary action dimensions capture well the behavioral tendencies of children, further testing and refining are needed to determine whether this approach will become viable for broadly categorizing and measuring coping processes. In this regard, a direction of future work would be to focus on other possible dimensions upon which coping behaviors may vary. For example, the degree of emotional engagement or disengagement could be measured in a manner similar to that advocated here: as a “pure” action-related tendency or dimension. Such an emotionality dimension could be integrated into the current framework as another dimension upon which specific strategies may vary.

In summary, our goal was to provide general support for multidimensional models of coping. Taken as a whole, the findings strongly validate a number of the underlying assumptions of such multidimensional models. As an initial effort in this regard, we view the outcomes of this study as an important step toward integrating in a coherent framework children’s strategic control processes. In addition, we view action theory as a particularly useful metatheoretical perspective to understand the various self-regulatory processes (beliefs and behaviors) that children utilize in negotiating their complex and often challenging worlds.

Author Note

These data were collected as part of a project examining children’s action-control regulation in the social domain conducted in conjunction with the Action Control and Child Development project, co-directed by Todd D. Little, Gabrielle Oettingen, and Paul B. Baltes at the Max Planck Institute for Human Development, Berlin. Parts of this archival data set have appeared in a prior publication and we thank the many persons involved once again. We are grateful to the members of the Institute’s Center for Lifespan Psychology and to numerous visiting scholars for their informative discussions of the questions addressed in this manuscript. We also thank Werner Scholtysik and Wolfgang Assmann for their computer resource management services, and Carol Albers, Matthias Grafhohf, Heidrun Gosloskly, and Anne Tachida for their assistance.

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References


**APPENDIX**

**TABLE A1** Reliability and validity of the BSC constructs at each time of measurement

<table>
<thead>
<tr>
<th>Construct</th>
<th>Time 1</th>
<th>Time 2</th>
<th>Time 3</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>std</td>
<td>h²</td>
</tr>
<tr>
<td><em>Direct Action</em> (x = 0.66, 0.71 &amp; 0.80)</td>
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<td></td>
<td></td>
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<tr>
<td>Item 1</td>
<td>0.41</td>
<td>0.29</td>
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<tr>
<td>Item 2</td>
<td>0.45</td>
<td>0.30</td>
<td>0.45</td>
</tr>
<tr>
<td>Item 3</td>
<td>0.48</td>
<td>0.30</td>
<td>0.45</td>
</tr>
<tr>
<td><em>Indirect Action</em> (x = 0.66, 0.75 &amp; 0.80)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Item 1</td>
<td>0.55</td>
<td>0.42</td>
<td>0.71</td>
</tr>
<tr>
<td>Item 2</td>
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<td>0.69</td>
</tr>
<tr>
<td>Item 3</td>
<td>0.59</td>
<td>0.41</td>
<td>0.63</td>
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<tr>
<td><em>Prosocial Action</em> (x = 0.57, 0.64 &amp; 0.68)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item 1</td>
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<td>0.47</td>
<td>0.55</td>
</tr>
<tr>
<td>Item 2</td>
<td>0.66</td>
<td>0.41</td>
<td>0.69</td>
</tr>
<tr>
<td>Item 3</td>
<td>0.63</td>
<td>0.43</td>
<td>0.68</td>
</tr>
<tr>
<td><em>Antisocial Action</em> (x = 0.57, 0.65 &amp; 0.68)</td>
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<td></td>
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<td>Item 1</td>
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<tr>
<td>Item 2</td>
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</tr>
<tr>
<td>Item 3</td>
<td>0.64</td>
<td>0.52</td>
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<tr>
<td><em>Avoidance</em> (x = 0.74, 0.78 &amp; 0.84)</td>
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<tr>
<td>Parcel 1</td>
<td>0.72</td>
<td>0.57</td>
<td>0.59</td>
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<tr>
<td>Parcel 2</td>
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<td>0.57</td>
<td>0.70</td>
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<tr>
<td>Parcel 3</td>
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<td>0.71</td>
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TABLE AI. (Continued)

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<tr>
<th>Construct</th>
<th>Time 1</th>
<th>Time 2</th>
<th>Time 3</th>
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<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>std</td>
<td>a²</td>
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<tr>
<td>Social Cooperation (r = .88, 37 &amp; 90)</td>
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<tr>
<td>Parcel 1.</td>
<td>.84</td>
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<td>.70</td>
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<tr>
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<td>.21</td>
<td>.75</td>
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<td>Seeking Emotional Support (r = .78, .70 &amp; .81)</td>
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<td>.22</td>
<td>.77</td>
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<td>Parcel 2.</td>
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<tr>
<td>Parcel 3.</td>
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<td>.22</td>
<td>.74</td>
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<tr>
<td>Aggressive Individualism (r = .79, .83 &amp; .82)</td>
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<tr>
<td>Parcel 1.</td>
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<td>.21</td>
<td>.76</td>
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<tr>
<td>Parcel 2.</td>
<td>.72</td>
<td>.21</td>
<td>.75</td>
</tr>
<tr>
<td>Social Exploitation (r = .89, .91 &amp; .88)</td>
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<td>1.52</td>
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<tr>
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<tr>
<td>Parcel 3.</td>
<td>.88</td>
<td>1.52</td>
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<tr>
<td>Hostility (r = .83 &amp; .74)</td>
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<tr>
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<tr>
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</table>

Note: Item refers to a single-item indicator. Parcel refers to the average of two single-item indicators. λ = the factor loadings constrained to be equal across time. Mean = the mean of each indicator. std = the standard deviation of each indicator. a² = the reliability of each indicator (the LISREL theta matrix). H² = the variance in each indicator accounted for by the latent factor.

LEARNING POTENTIAL AND ANXIOUS TENDENCY: TEST ANXIETY AS A BIAS FACTOR IN EDUCATIONAL TESTING

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Contrary to conventional educational testing, in so-called dynamic assessment, subjects are allowed to consult help during testing or are offered prior training. The differential results of both testing procedures are sometimes ascribed to the idea that dynamic tests reflect the breadth of the zone of proximal development on top of independent achievement. Alternative explanations claim that conventional tests are more strongly biased towards various characteristics of persons, which have a negative influence on performance, when compared to dynamic tests. In this study, it was hypothesized that static as well as dynamic assessment is biased towards anxious tendencies of subjects, but the former more strongly than the latter. In order to investigate this proposition, the performance of subjects on dynamic and static tests was systematically compared and related to measures of test anxiety in a longitudinal experiment. In the experiment, repeated measures of independent mathematics achievement as well as mathematics learning potential were gathered among students of secondary education in the Netherlands. Prior to every mathematics test, subjects filled out a test anxiety questionnaire. After every mathematics test, subjects filled out a general state anxiety questionnaire. The participating subjects were students from secondary education, either preparing for higher vocational training or university, aged approximately 15 years on average.

The results of the experiment showed that lack of self-confidence is an important constituent factor of test anxiety, apart from worry and emotionality. The data supported the assumption that such testing procedures are less biased towards anxiety than conventional tests, but it was not established that dynamic testing procedures render results that are not biased by test anxious tendencies.

Keywords: Test anxiety; Mathematics; Test bias; Learning potential; Zone of proximal development; Cognition

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